Use and Explanation of Cropland Interpretations

Information in this subsection of the FOTG can be used to plan the use and management of soils for crops or pasture. Conservation planners and others using this information can evaluate the effects of crop management systems on productivity and on the environment in the county. This information can be used to maintain or create a land use pattern that is in harmony with the natural soil.

CROP INTERPRETATIONS - CONTENTS

Soil Erodibility (K) Factor and Soil-loss Tolerance (T) Value

General

Soil erodibility factors (K) and soil-loss tolerances (T) are used in an equation that predicts the amount of soil loss resulting from rainfall erosion of cropland. The soil-loss prediction procedure is useful to guide the selection of practices for soil and water conservation. The procedure is outlined and illustrated in Agricultural Handbook No. 537.

Soil Erodibility (K) Factor

The soil erodibility factor "K" indicates the susceptibility of a soil to sheet and rill erosion by water. Soil properties that influence erodibility by water are: (1) Those that affect infiltration rate, movement of water through the soil, and water storage capacity; and (2) those that resist dispersion, splashing, abrasion, and transporting forces from rainfall and runoff. Soil properties that effect soil erodibility the most are percent silt plus very fine sand. Percent organic matter, percent sand coarser than very fine sand, structure, and permeability also effect soil erodibility.

Soil-loss Tolerance (T) Factor

The soil-loss tolerance factor "T" is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Rates of 1 through 5 are used, depending upon soil properties and prior erosion.

Soil-loss tolerances were subjectively evaluated, based on the following general guides:

1. Maintenance of an adequate rooting depth for crop production.
2. Potential crop yield reduction.
3. Maintenance of water control structures affected by sedimentation.
4. Prevention of gullies.
5. Value of nutrients lost.

Soil Erodibility (K) Factors and Soil-loss Tolerance (T) Values are listed in FOTG Section II for each soil survey map unit. These factors are utilized when making soil loss predictions and erosion control recommendations through the use of Revised Universal Soil Loss Equation (RUSLE).

Explanation of Wind Erosion

Wind Erodibility Groups

Soil erodibility by wind is directly related to the percentage of dry non erodible surface soil aggregates larger than 0.84 mm in diameter. From this percentage, the wind erodibility index (I-factor) is determined. The I-factor is an expression of the stability of these soil aggregates against breakdown by tillage and abrasion from wind erosion. Soils are placed in Wind Erodibility Groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 mm as shown in the following table.

WEG	Properties of Soil Surface Layer	Dry Soil Aggregates >0.84mm Percent	Wind Erod. Index(I) T/Ac/Yr
1	Very fine sand, fine sand, sand, or coarse sand	1	180
2	Loamy very fine sand, loamy fine sand, loamy sand, loamy coarse sand, or sapric (1) organic soil materials	10	134
3	Very fine sandy loam, fine sandy loam, sandy loam, or coarse sandy loamy	25	86
4	Clay, silty clay, noncalcareous clay loam, or silty clay loam with >35 percent clay content	25	86
4L	Calcareous loam, silt loam, clay loam, or silty clay loam	25	86
5	Non calcareous loam and silt loam with <20 percent clay content, or sandy clay loam, sandy clay, and hemic (1) organic soil materials	40	56
6	Noncalcareous loam and silt loam with >20 percent clay content, or noncalcareous clay loam with <35 percent clay content	45	48
7	Silt, noncalcareous silty clay loam with >35 percent clay content and fibric (1) organic soil material	50	38
8	Soils not suitable for cultivation due to coarse fragments or wetness; wind erosion is not a problem.	--	--

(1) See Soil Taxonomy (Agricultural Handbook No. 436) for definition.

A more detailed Explanation of Wind Erosion is available in the Florida Erosion Control Handbook as well as the National Soil Handbook. WEG values are utilized when making soil loss predictions and erosion control recommendations through the use of Wind Erosion Equation (WEQ).

Explanation of Hydrologic Soil Groups

General

The Hydrologic Soil Group, designated A, B, C, or D, is a group of soils that, when saturated, have the same runoff potential under similar storm events and cover conditions. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to seasonally high water table, intake rate, permeability after prolonged wetting, and depth to very slowly permeable layer. The influences of ground cover and slope are treated independently, not in hydrologic soil groups.

In the definitions of the classes, infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. Transmission rate is the rate at which water moves in the soil and is controlled by properties of the soil layers.

Hydrologic Soil Group A

Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well-drained to excessively drained sands or gravels. These soils have a high rate of water transmission (Low runoff potential). The rate of water transmission is greater than 0.30 in/hr.

Hydrologic Soil Group B

Soils having moderate infiltration rates when thoroughly wetted, consisting chiefly of moderately deep or deep, moderately well or well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15 to 0.30 in/hr.).

Hydrologic Soil Group C

Soils having slow infiltration rates when thoroughly wetted, consisting chiefly of (1) soils with a layer that impedes the downward movement of water, or (2) soils with moderately fine or fine textures and slow infiltration rate. These soils have a slow rate of water transmission (0.05 to 0.15 in/hr.).

Hydrologic Soil Group D

Soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of (1) clayey soils with high swelling capacity or potential, (2) soils with a high permanent water table, (3) soils with a claypan or clay layer at or near the surface, and (4) shallow soils over nearly impervious materials. These soil have a very slow rate of water transmission (High runoff potential). The rate of water transmission is 0 to 0.05 in/hr.

Hydrologic soil groups for this Field Office Technical Guide are listed in FOTG Section II (Soil Legend).

IMPORTANT FARMLANDS

Important Farmlands include both prime farmland and unique farmland as well as additional important farmlands as identified by state or local governments. In the following pages all of the components of Important Farmlands are discussed. The components of Important Farmlands are: Prime Farmland, Unique Farmland, Additional Farmland of Statewide Importance, and Additional Farmland of Local Importance.

USDA and SCS Policy Regarding Important Farmland

1. Rural Development Act of 1972

   Gives SCS responsibility for inventorying and monitoring the nation's soil and water resources.

2. Secretary's Memorandum No. 1827 October 26, 1973.
   States USDA Policy on land use.

3. Secretary's Memorandum No. 1827, Supplement No. 1 June 21, 1976.
   States USDA Policy advocating protection of Prime and Unique Farmland.

4. Federal Register, Part 657, Subpart A January 31, 1978.
   Prescribes general guidelines for a national program of inventorying prime and unique farmland as well as other farmlands of statewide and local importance.

5. Secretary's Memorandum No. 1827 (revised) October 30, 1978.
   States USDA policy to assist local and state governments in defining and meeting needs for growth and development, to protect the natural environment, and to assure adequate supplies of high quality food, fiber, wood, and water

6. Public Law 97-98 December 22, 1981.
   Establishes Farmland Protection Policy Act to minimize the extent that Federal programs contribute to the conversion of farmlands to nonagricultural uses and to insure Federal programs are administrated to protect farmland.

7. Federal Register, Part 658 June 5, 1984.
   Prescribes guidelines for a Land Use and Site Assessment program to evaluate the suitability of conversion of agricultural lands to nonagricultural use. Sets criteria for Land Evaluation and for Site Assessment.

8. Florida SCS Policy October 1, 1984.
   Proposed land use changes that involve the expenditure of federal funds require a completed form AD - 1006 (Farmland Conversion Impact Rating). Parts I and III are completed by the federal agency providing the funds. The partially completed form is sent to the SCS State Soil Scientist. The State Soil Scientist completes Parts II, IV, and V of the form and returns it to the federal agency. The federal agency completes parts VI and VII.

FARMLAND PROTECTION POLICY ACT AND NRCS

BACKGROUND:

The FPPA requires a federal agency that is expending funds (for technical or financial assistance, but not planning assistance) on a project that will convert farmland to a non agricultural use determine the impact of the conversion to the resource base. The impact is determined by completing the form AD 1006 for each project that proposes to concert farmland to a non agricultural use. The Farmland Protection Policy Act provides the following:

1. An avenue to lessen the impact of the use of federal funds on the conversion of farmland to a non agricultural use.

2. An avenue for project funding withdrawal if FPPA rules are not followed.

3. An avenue for review (by anyone) of all agency sponsored projects to determine in the agency is adhering to FPPA law.

NRCS RESPONSIBILITIES:

1. All NRCS employees are required (by law) to advocate that the actions of the federal government do not cause farmland to be irreversibility converted to non agricultural use. Therefore, during the review of a project which may involve a federal agency, NRCS employees should make a statement similar to the following:

> IF THIS PROJECT IS FUNDED BY A FEDERAL AGENCY OR AGENCIES IT IS SUBJECT TO THE PROVISIONS OF THE FARMLAND PROTECTION POLICY ACT. PLEASE CONTACT THE STATE SOIL SCIENTIST, NATURAL RESOURCES CONSERVATION SERVICE, GAINESVILLE, FLORIDA IF ADDITIONAL INFORMATION IS NEEDED.

2. All NRCS projects (except certain exempt projects) are subject to the provisions of the FPPA. These projects should not cause farmland to be irreversibly converted to non agricultural use.

EXEMPT PROJECTS	NON EXEMPT PROJECTS
EXIGENCY EWP	NON EXIGENCY EWP
PL 566 (LAND TREATMENT)	PL 566 (STRUCTURES)
RC&D (PLANNING)	RC&D (STRUCTURES)
CO-01 (ON-FARM USE)	CO-01 (MULTI-FARM USE)
STRUCTURAL PLANNING	STRUCTURAL ASSISTANCE

For non exempt NRCS projects the following procedure is used:

1. The District Conservationist of the county in which a project is proposed provides the state soils staff location and extent information (including soil survey and topographic maps).

2. The state soils staff will complete the form AD 1006.

3. If the total number of points exceed 160 points, the state soils staff will return the form and location materials to the District Conservationist for selection of alternative site(s).

4. If the original or one of the alternative sites does not have a rating of less than 160 points, the project will not be completed.

Prime Farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods.

In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.

The criteria for Prime Farmland are as follows:

(1) Available water capacity is more than 4.0 inches in the upper 40 inches,

(2) Soil temperature regime is thermic or hyperthermic,

(3) Soil reaction is 4.5 to 8.4 in the upper 40 inches,

(4) Seasonal high water table is more than 2.5 feet from the surface during the cropping season,

(5) Conductivity of saturation extract is less than 4 mmhos/cm and exchangeable sodium is less than 5 percent in the upper 40 inches,

(6) Flooding frequency is less than frequent during the growing season,

(7) Product of K (erodibility factor) times percent slope is less than 1.6,

(8) Permeability rate is more than 0.06 in the upper 20 inches, and

(9) Percent by volume of coarse fragments is less than 10 percent in the surface layer of the soil.

Prime farmland soil survey map units are indicated in FOTG Section II.

Unique Farmland

Unique farmland is the second component of Important Farmland.

Unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, fruit, and vegetables.

Specific characteristics of unique farmland include:

1. Is used for a specific high-value food or fiber crop.

2. Has a moisture supply that is adequate for the specific crop. The supply is from stored moisture, precipitation, or a developed irrigation system.

3. Combines favorable factors of soil quality, growing season, temperature, humidity, air drainage, elevation, aspect, or other conditions, such as nearness to market, that favor the growth of a specific food or fiber crop.

Following is a list of high-value food crops that, when combined with other favorable factors, qualify lands as unique farmlands;

Tree Fruits: Citrus (oranges, grapefruit, lemons, limes, tangerines, tangelos), Avocados, Mangos, Papayas.

Vegetables: Lettuce (all types), Cabbage, Radishes, Celery, Carrots, Eggplants, Squash, Sweet corn, Tomatoes, Peas, Snap beans, Pole beans, Lima beans, Cucumbers, Peppers, Escarole, Potatoes

Strawberries and Sugarcane

Additional Farmland of Statewide and Local Importance

Additional farmland of statewide and local importance are the remaining components of Important Farmland. This is land, in addition to prime and unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, and oilseed crops. Criteria for defining and delineating additional farmland of statewide importance are determined by appropriate state agencies.

The state of Florida has not established criteria for defining and delineating additional farmland of statewide importance; therefore, Additional Farmland of Statewide Importance does not exist in Florida.

Criteria for defining and delineating additional farmland of local importance are determined by appropriate county agencies. Some counties have established criteria for defining and delineating Additional Farmland of Local Importance. Criteria used by these counties are as follows:

1. Aquic or Udic moisture regime,

2. Available water capacity is more than 2.0 inches in the upper 40 inches,

3. Seasonal high water table is more than 1.5 feet from the surface during the cropping season,

4. Flooding frequency is none to occasional during the cropping season,

5. Product of K (erodibility factor) times percent slope is less than 3.0,

6. Slope is less than 15 percent,

7. Percent by volume of coarse fragments is less than 25 percent in the upper 20 inches of the soil, and

8. Permeability rate is more than 0.06 inches/hour.

If criteria existed, Section II would indicate the soil survey map units that are Additional Farmland of Local Importance.

Land Capability Classification

The land capability classification system is used to show, in a general way, the suitability of soils for cropland. It is a three-category interpretative system. The two highest categories, class and subclass, give broad perspective of the suitability of map units for certain crops or pasture. These categories indicate the degree and kinds of limitations for these uses. The system evaluates soils for mechanized farming systems that produce the more common cultivated field crops, such as corn, small grains, cotton, hay, and field grown vegetables.

Capability Class

The highest category of the system is the capability class. The capability classes are groups of soils that have the same general suitability for the broad kinds of use common on farms and ranches. There are eight classes designated by Roman numerals I through VIII.

Classes I, II, III, and IV are suitable for mechanized production of common field crops if properly managed, and for production of pasture and woodland. The degree of limitation for production of cultivated crops increases progressively for class I to class IV. Limitations may affect production as well as the risk of permanent soil deterioration, as by erosion.

Classes V, VI, and VII are generally not suited to mechanized production of common field crops without special management, but are suitable for permanent cover such as grasses and trees. The severity of the soil limitations for crops increases from class V to class VII. Areas in class VIII are generally not suited to crops, pasture, or wood products without management that is impractical. Class VIII areas may have potential for other uses, such as recreation or wildlife habitat.

Capability Subclass

The subclass identifies the dominant kind of limitation in the class. The dominate kind of limitation is designated by adding a small letter, e, w, s, or c, to the class numeral.
For example, in capability subclass "IIe", the letter "e" shows that the main limitation is risk of erosion unless a close-growing plant cover is maintained. "w" shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); "s" shows that the soil is limited mainly because it is shallow, droughty, or stony; and "c" shows that the chief limitation is climate that is very cold or very dry. "c" is not used in Florida.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use mainly to pasture, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by "w".

The capability class and subclass for soil survey map units are listed

Land Capability Unit

The lowest category of the capability system is the capability unit. Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Units are designated by Arabic numerals, for example IIe2.

Land Capability Units for each soil survey map unit are listed in FOTG Section II (Soil Legend). Land Capability Unit descriptions are found in Section II (Soil Descriptions).

Crop Yield Estimates

The average yields per acre that can be expected of the principal crops under a high level of management are presented in the following table. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, or green manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change. Absence of a yield indicates that the soil is not suited to the crop or the crop is generally not grown on the soil.

Crop Yield Estimates by soil survey map unit are listed in the Soil Survey.

Soil Potential Ratings

Soil potential ratings are numerical values that indicate the relative quality of a soil for a particular use compared with other soils of a given area. Yield or performance level, the relative cost of applying modern technology to minimize the effects of any soil limitation, and the adverse effects af any continuing limitation on social, economic, or environmental values are considered. The criteria for developing soil potential ratings for a particular use are established specifically for the area for which the ratings are made; the criteria may be different in nearby counties, groups of counties, or regions.

Soil Potential ratings are developed primarily for planning purposes and are not intended as recommendations for soil use. They help decision makers determine the relative suitability of soils for a given use. They are used with other resource data as a guide to making land use decisions.

Additional information concerning soil potentials are located in the National Soils Handbook as well as the National Land Evaluation and Site Assessment Manual.

To develop soil potential ratings, a systematic procedure is required to identify measures for overcoming soil limitations, the performance level of the soils, and limitations continuing after corrective measures have been applied. This procedure also provides a numerical system to derive a soil potential index. Generally, the higher the index the more suitable the soil is for the intended use. This index is as follows:

Soil Potential Index Values

Map Symbol	Soil Potential Index	Map Symbol	Soil Potential Index